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4 RESEARCH DRIVE
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PERILLA, JASON M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/567,629	VADDE ET AL.
	Examiner	Art Unit
	Jason M. Perilla	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9 and 12-37* is/are rejected.

7)☒ Claim(s) *10 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-7 and 9-41 are pending in the instant application.

Response to Arguments

2. Applicant's arguments filed August 2, 2007 have been fully considered but they are not persuasive.

Regarding the Applicant's argument against the prior art combinations including at least Wright et al (U.S. Pat. No. 6313703; "Wright"), the arguments are not persuasive. Applicant notes that equation 1 of Wright (col. 9, line 28) shows two baseband signals being amplified by the same gain (k) to produce an amplified version of the original and submits that, if the individual gains of Wright's individual amplifiers (fig. 2, refs. 15 and 16) were not the same, "then in no instance could one create an amplified version of the original signal s(t) ". However, the Examiner suggests that, in light of the teachings of Pengelly et al (U.S. Pub. No. 2004/0113697; "Pengelly"), one may yet be motivated to alter the individual gains of Wright's amplifiers because the combination of Wright in view of Pengelly affords new advantages which are understood by one having ordinary skill in the art that may overcome the fact that Wright's original "equation" may no longer be applicable. While the Applicant seems to argue that any time a particular prior art reference is modified to operate beyond its original mode of operation, the combination is improper simply because the original reference operates in a new manner, the Examiner does not agree. Furthermore, the Examiner submits that the one skilled in the art would have a reasonable expectation of success in

combining the inventive disclosures and teachings of Wright in view of Pengelly even if the output equation 1 of Wright would be altered in the process.

Regarding the Applicant's argument against the prior art combinations including at least Chethik et al (U.S. Pat. No. 6593827; "Chethik"), the arguments are not persuasive. The Applicant notes that Chethik's amplifiers each apply equal gain but fails to take into account the combination of Chethik with Kornfeld et al (U.S. Pat. No. 5974041; "Kornfeld") to meet such limitations. The Applicant further argues that Chethik in view of Kornfeld do not disclose that "each bit of the bit stream represents a different significance". Although the various bit streams of Chethik may not be characterized as being "most significant", "less significant,", etc.; they each have a difference significance as broadly as claimed because each carries independent information exclusive of the other streams.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 5, 30 and 31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wright et al (U.S. Pat. No. 6313703; "Wright") in view of Pengelly et al (U.S. Pub. No. 2004/0113697; "Pengelly").

Regarding claim 1, Wright discloses a power synthesizer (fig. 2) comprising: a plurality of n stages in parallel with one another (i.e. paths 13 and 14; $Ph_A(t)$ and $Ph_B(t)$),

wherein n is an integer at least equal to two, each of the n stages comprising: a modulator (fig. 2, refs. 23 and 24) and a discrete amplitude amplifier (fig. 2, refs. 15 and 16) in series with one another, each nth discrete amplitude amplifier adapted to apply a gain (fig. 2, ref. "k"); and an actuator (fig. 2, ref. 11) adapted to simultaneously switch the first and second modulators. As broadly as claimed, Wright's "signal component separator" is an actuator because the outputs (i.e. paths 13 and 14; $Ph_A(t)$ and $Ph_B(t)$) it presents to the downstream modulators and amplifiers "switch" them on and off according to their instant values in time. Wright discloses n discrete amplifiers applying a gain but does not explicitly disclose that each amplifier applies a gain that is unique as compared to the other amplifiers. However, the use of a variety of different gain amplifiers in a parallel amplifier is well known in the art as taught by Pengelly. Pengelly teaches that a plurality of parallel amplifiers (fig.1, refs. 20-23) "need not be of the same size" and can "have unequal peripheries or gate widths" for "a broad range of power operation" (¶ 0012). Further, Pengelly teaches that such an arrangement of individual transistors can thereby be matched as carrier and peaking amplifiers respectively (¶ 0013). It is understood in the art that, the use of different gate widths determines, in part, the gain of an amplifier and Pengelly teaches that using such amplifiers with various gain values will enable "a broad range of power operation". Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the amplifiers of Wright could be chosen such that each would have a unique gain value as taught by Pengelly because a broad range of power operation could be achieved.

Regarding claim 2, Wright in view of Pengelly disclose the limitations of claim 1 as applied above. Further, Wright discloses that each of the n discrete amplifiers comprises a constant envelope amplifier (abstract; col. 3, lines 15-25; col. 7, lines 55-60).

Regarding claim 5, Wright in view of Pengelly disclose the limitations of claim 1 as applied above. Further, Wright discloses a power combiner (fig. 2, ref. 25) having parallel inputs coupled to outputs of the n discrete amplitude amplifiers.

Regarding claim 30, Wright in view of Pengelly disclose the limitations of claim 1 as applied above. Further, because the amplifiers of Pengelly have predetermined gain properties, they each apply a gain that differs from that applied by another nearest-power discrete power amplifier by a fixed amount.

Regarding claim 31, Wright in view of Pengelly disclose the limitations of claim 30 as applied above. Wright in view of Pengelly do not explicitly disclose that the difference between each pair of nearest-power discrete amplifiers has a gain difference of 6db. However, in the instant specification, the use of the particular gain difference of 6db is not presented as solving any particular problem or consisting of any particular inventive novelty. Furthermore, one skilled in the art would expect that, depending upon a desired design consideration, the fixed difference could be of any value while still maintaining the functionality and spirit of the invention. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to use a fixed difference of 6db, or any other relative difference, between the nearest-power discrete amplifiers depending upon a desired design choice.

5. Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Wright in view of Pengelly, and in further view of Porco et al (U.S. Pat. No. 7020215; "Porco").

Regarding claim 9, Wright in view of Pengelly disclose the limitations of claim 1 as applied above. Wright in view of Pengelly do not disclose that each of the n stages has an output coupled to an input of a separate transmit antenna. However, the use of separate transmission antennas is well known in the art as illustrated by Porco (fig. 2, refs. 253-256). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that each of the n stages of Wright could be coupled directly to an input of a separate antenna as illustrated by Porco because the additional antenna diversity can be useful for wireless communication.

6. Claims 1, 5, 6, 7, 23, 29, and 34-37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chethik et al (U.S. Pat. No. 6593827; "Chethik" – IDS paper February 7, 2006) in view of Kornfeld et al (U.S. Pat. No. 5974041; "Kornfeld").

Regarding claim 1, Chethik discloses a power synthesizer (fig. 1) comprising: a plurality of n stages in parallel with one another, wherein n is an integer at least equal to two, each of the n stages comprising: a modulator (fig. 1, ref. 13, etc.) and a discrete amplitude amplifier (fig. 1, ref. 13, etc.) in series with one another, each nth discrete amplitude amplifier for applying a gain (inherent). Chethik discloses n discrete amplifiers applying a gain but does not explicitly disclose that (1) each amplifier applies a gain that is unique as compared to the other amplifiers or (2) a actuator for simultaneously switching the first n modulator. However, the use of a variety of different gain amplifiers in a parallel amplifier is well known in the art as taught by Kornfeld.

Kornfeld teaches a plurality of parallel amplifiers (fig. 2, refs. A1-A4) each having a particular gain ratio (fig. 3; col. 5, lines 10-35). Kornfeld further teaches switching, via an input network or actuator (fig. 2, ref. 44), between the various parallel amplifers (col. 5, lines 35-65). Finally, Kornfeld teaches that such an arrangement of individual amplifiers "appears to surrounding circuit elements as a unitary amplifier having constant gain over an entire output range" (col. 5, lines 50-55). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the amplifiers of Chethik could be chosen such that each would have a unique gain value as taught by Kornfeld because, in conjunction with the inclusion of Kornfeld's input network actuator into the invention of Chethik, an amplifier with a wide linear region of operation could be effectively achieved using only less costly parts (i.e. several individual amplifiers each having a smaller linear gain region).

Regarding claim 5, Chethik in view of Kornfeld disclose the limitations of claim 1 as applied above. Further, Chethik discloses a power combiner having parallel inputs coupled to outputs of the n discrete amplitude amplifiers (fig. 1, ref. 16).

Regarding claim 6, Chethik in view of Kornfeld disclose the limitations of claim 1 as applied above. Further, Chethik discloses that, for each of the n stages, the discrete amplifier has an input that is directly coupled to an output of the modulator (fig. 1).

Regarding claim 7, Chethik in view of Kornfeld disclose the limitations of claim 1 as applied above. Further, Chethik discloses a discrete amplitude generator (fig. 1, ref. 15) having parallel outputs coupled to inputs of the n stages, said discrete amplitude generator adapted to convert a real input (fig. 1, "DATA BITS IN") to parallel binary

outputs (fig. 1, output of 16). As broadly as claimed, the input data is considered to be "real input" data.

Regarding claim 23, Chethik discloses a method of transmitting a signal on a multicarrier communication channel comprising: providing a separate bit of a bit stream on each of n parallel inputs (fig. 1, outputs of ref. 15), each bit of the bit stream representing a different significance (inherent); for each of the n parallel inputs, controlling a phase of the input bit (fig. 1, ref. 14) and amplifying a power of the input bit via a power amplifier (fig. 1, ref. 13); and, combining (fig. 2, ref. 16) all n phase controlled and amplified bits in one of a spatial manner and a circuit manner. Chethik discloses n amplifiers applying a gain for each of n parallel inputs but does not explicitly disclose that (1) each amplifier applies a gain that is unique as compared to the other amplifiers. However, the use of a variety of different gain amplifiers in a parallel amplifier is well known in the art as taught by Kornfeld. Kornfeld teaches a plurality of parallel amplifiers (fig. 2, refs. A1-A4) each having a particular gain ratio (fig. 3; col. 5, lines 10-35) and that such an arrangement of individual amplifiers "appears to surrounding circuit elements as a unitary amplifier having constant gain over an entire output range" (col. 5, lines 50-55). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the amplifiers of Chethik could be chosen such that each would have a unique gain value as taught by Kornfeld because an amplifier with a wide linear region of operation could be effectively achieved using only less costly parts (i.e. several individual amplifiers each having a smaller linear gain region).

Regarding claim 29, Chethik in view of Kornfeld disclose the limitations of claim 23 as applied above. Further, Chethik discloses combining (fig. 1, ref. 16) all the phase controlled bits prior to transmission.

Regarding claim 34, Chethik in view of Kornfeld disclose the limitations of claim 23 as applied above. Further, because the amplifiers of Chethik have determined gain properties, they each apply a gain that differs from that applied by another nearest-power discrete power amplifier by a fixed amount. That is, at least for specified periods of time, the individual gain values of the discrete amplifiers of Chethik will have fixed values.

Regarding claim 35, Chethik in view of Kornfeld disclose the limitations of claim 34 as applied above. Chethik in view of Kornfeld do not explicitly disclose that the difference between each pair of nearest-power discrete amplifiers has a gain difference of 6db. However, in the instant specification, the use of the particular gain difference of 6db is not presented as solving any particular problem or consisting of any particular inventive novelty. Furthermore, one skilled in the art would expect that, depending upon a desired design consideration, the fixed difference could be of any value while still maintaining the functionality and spirit of the invention. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to use a fixed difference of 6db, or any other relative difference, between the nearest-power discrete amplifiers depending upon a desired design choice.

Regarding claims 36 and 37, Chethik in view of Kornfeld disclose the limitations of the claims as applied to claim 1 above.

7. Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Chethik in view of Kornfeld, and in further view of Porco.

Regarding claim 24, Chethik in view of Porco disclose the limitations of claim 23 as applied above. Chethik in view of Porco do not disclose that each of the n stages has an output coupled to an input of a separate transmit antenna. However, the use of separate transmission antennas is well known in the art as illustrated by Porco (fig. 2, refs. 253-256). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that each of the n stages of Chethik could be coupled directly to an input of a separate antenna as illustrated by Porco because the additional antenna diversity can be useful for wireless communication.

8. Claims 3, 4, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chethik in view of Kornfeld, and in view of Nguyen et al (U.S. Pat. No. 6148040; "Nguyen").

Regarding claim 3, Chethik in view of Kornfeld disclose the limitations of claim 1 as applied above. Chethik in view of Kornfeld disclose that the n modulators are QPSK modulators (Chethik; fig. 1, ref. 12), but do not disclose that they are continuous phase modulators. However, various types of modulation are well known and accepted in the art and Nguyen teaches the use of continuous phase modulation (col. 1, lines 30-45). Nguyen teaches that, "because the CPM signal has a constant envelope, a power amplifier can be operated at maximum power without affecting the spectrum of the signal" (col. 1, lines 39-41). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the QPSK

modulation utilized by Chethik could be replaced by a continuous phase modulation technique as taught by Nguyen because it enables power amplifiers to be utilized with the best power efficiency.

Regarding claim 4, Chethik in view of Kornfeld, and in further view of Nguyen disclose the limitations of claim 3 as applied above. Further, Nguyen discloses that each of the n modulators comprise pulse amplitude modulators (col. 2, lines 10-20).

Regarding claim 25, Chethik in view of Kornfeld disclose the limitations of claim 23 as applied above. Chethik in view of Kornfeld disclose that the n modulators are QPSK modulators (Chethik; fig. 1, ref. 12), but do not disclose that they are continuous phase modulators. However, various types of modulation are well known and accepted in the art and Nguyen teaches the use of continuous phase modulation (col. 1, lines 30-45). Nguyen teaches that, "because the CPM signal has a constant envelope, a power amplifier can be operated at maximum power without affecting the spectrum of the signal" (col. 1, lines 39-41). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the QPSK modulation utilized by Chethik could be replaced by a continuous phase modulation technique as taught by Nguyen because it enables power amplifiers to be utilized with the best power efficiency.

Regarding claim 26, Chethik in view of Kornfeld, and in further view of Nguyen disclose the limitations of claim 25 as applied above. Further, Nguyen discloses that the CPM modulation technique may be implemented as a pulse amplitude modulator (col. 2, line 15).

Regarding claim 27, Chethik in view of Kornfeld, and in further view of Nguyen disclose the limitations of claim 25 as applied above. Further, Nguyen discloses that the CPM modulation technique may be implemented as a GMSK technique (col. 1, lines 40-45).

9. Claims 12-17, 22, 32, and 33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosur et al (U.S. Pub. No. 2003/0152023; "Hosur") in view of Chethik, and in further view of Kornfeld.

Regarding claim 12, Hosur discloses a transmitter (fig. 2) comprising an inverse fast fourier transmit block (fig. 2, ref. 20), said IFFT block adapted to convert an amplitude modulated input to a bit modulated output. However, Hosur does not explicitly disclose a power synthesizer block as applied to claim 1 above. However, Chethik in view of Kornfeld disclose such a power synthesizer block as applied to claim 1 above. Further, the advantage to the power synthesizer of Chethik in view of Kornfeld is the highly linear amplifier output created over a wide range. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the RF front end amplifier of Hosur (i.e. fig. 2, ref. 26) could be replaced by the power synthesizer block of Chethik in view of Kornfeld because it provides an exemplary amplifier with a wide linear range of operation.

Regarding claim 13, Hosur discloses a transmitter (fig. 2) comprising, in series, an encoder (12), a serial to parallel converter (18), a parallel to serial converter (22) for outputting a digital signal at baseband, and at least one transmit antenna (AT_{TX}). Hosur discloses an RF front end power amplifier (fig. 2, ref. 26) but does not explicitly disclose

a power synthesizer block comprising at least two discrete amplifier stages in parallel, and each discrete amplifier stage comprising a discrete amplitude amplifier for applying a gain that differs from that applied by each other discrete amplitude amplifier. However, Chethik in view of Kornfeld disclose such a power synthesizer block as applied to claim 1 above. Further, the advantage to the power synthesizer of Chethik in view of Kornfeld is the highly linear amplifier output created over a wide range. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the RF front end amplifier of Hosur (i.e. fig. 2, ref. 26) could be replaced by the power synthesizer block of Chethik in view of Kornfeld because it provides an exemplary amplifier with a wide linear range of operation.

Regarding claim 14, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 13 as applied above. Further, in the combination of Hosur in view of Chethik, and in further view of Kornfeld; no digital to analog converter is utilized between the parallel to serial converter and the power synthesizer block (Hosur; fig. 2).

Regarding claim 15, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 13 as applied above. Further, Chethik discloses that each of the at least two discrete amplifier stages (fig. 1, ref. 11) comprises a discrete amplifier (fig. 1, ref. 13) and a modulator (fig. 1, ref. 12) in series with one another.

Regarding claim 16, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 15 as applied above. Further, Hosur discloses an inverse fast fourier transform IFFT block (fig. 2, ref. 20) disposed between the serial to

parallel converter (fig.2, ref. 18) and the parallel to serial converter (fig. 2, ref. 22), the power synthesizer block (of Chethik & Kornfeld) further comprising a discrete amplitude generator (Chethik; fig. 1, ref. 15) for converting a real valued input from the IFFT block to parallel binary outputs, each parallel binary output coupled to an input of a modulator (Chethik; fig. 1, ref. 12). As broadly as claimed, the input data is considered to be "real input" data.

Regarding claim 17, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 15 as applied above. Further, the power synthesizer block of Chethik in view of Kornfeld comprises at least one power combiner (Chethik; fig. 1, ref. 16) coupling an output of each of the at least two discrete amplifier stages with the at least one transmit antenna (Hosur; fig. 2, "AT_{TX}").

Regarding claim 22, Hosur in view of Chethik, in further view of Kornfeld disclose the limitations of claim 15 as applied above. Further, Hosur discloses that the transmitter is disposed in one of a base or mobile station (fig. 1).

Regarding claim 32, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 13 as applied above. Further, because the amplifiers of Chethik have determined gain properties, they each apply a gain that differs from that applied by another nearest-power discrete power amplifier by a fixed amount. That is, at least for specified periods of time, the individual gain values of the discrete amplifiers of Chethik will have fixed values.

Regarding claim 33, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 13 as applied above. Hosur in view of Chethik, and in

further view of Kornfeld do not explicitly disclose that the difference between each pair of nearest-power discrete amplifiers has a gain difference of 6db. However, in the instant specification, the use of the particular gain difference of 6db is not presented as solving any particular problem or consisting of any particular inventive novelty. Furthermore, one skilled in the art would expect that, depending upon a desired design consideration, the fixed difference could be of any value while still maintaining the functionality and spirit of the invention. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to use a fixed difference of 6db, or any other relative difference, between the nearest-power discrete amplifiers depending upon a desired design choice.

10. Claims 18, 19 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosur in view of Chethik, in further view of Kornfeld, and in further view of Nguyen.

Regarding claim 18, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 15 as applied above. Chethik discloses that the n modulators are QPSK modulators (Chethik; fig. 1, ref. 12), but does not disclose that they are continuous phase modulators. However, various types of modulation are well known and accepted in the art and Nguyen teaches the use of continuous phase modulation (col. 1, lines 30-45). Nguyen teaches that, "because the CPM signal has a constant envelope, a power amplifier can be operated at maximum power without affecting the spectrum of the signal" (col. 1, lines 39-41). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made

that the QPSK modulation utilized by Chethik could be replaced by a continuous phase modulation technique as taught by Nguyen because it enables power amplifiers to be utilized with the best power efficiency.

Regarding claim 19, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 15 as applied above. Chethik discloses that the n modulators are QPSK modulators (Chethik; fig. 1, ref. 12), but does not disclose that they are continuous phase modulators. However, various types of modulation are well known and accepted in the art and Nguyen teaches the use of continuous phase modulation; GMSK in particular (col. 1, lines 30-45). Nguyen teaches that, "because the GMSK signal has a constant envelope, a power amplifier can be operated at maximum power without affecting the spectrum of the signal" (col. 1, lines 39-41). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the QPSK modulation utilized by Chethik could be replaced by a continuous phase GMSK modulation technique as taught by Nguyen because it enables power amplifiers to be utilized with the best power efficiency. It the case of using a CPM/GMSK modulation technique, it follows that the discrete amplifiers of Chethik thereby comprise constant envelope amplifiers because they always amplify a constant amplitude signal.

Regarding claim 28, Chethik, in further view of Kornfeld, and in further view of Nguyen disclose the limitations of claim 25, as applied above and, similarly, Hosur in view of Chethik, in further view of Kornfeld, and in further view of Nguyen disclose the limitations of claim 25 as applied in claim 18 above. Further, Hosur discloses, previous

to providing a separate bit of a bit stream (Chethik; i.e. output of fig. 2, ref. 15; Chethik fig. 2 replacing Hosur fig. 2, ref. 26), converting an amplitude modulated signal (fig. 2, ref. 16; ¶ 0017; pg. 3, left col., line 40) to the bit stream.

11. Claims 20 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosur in view of Chethik, in further view of Kornfeld, and in further view of Porco.

Regarding claim 20, Hosur in view of Chethik, and in further view of Kornfeld disclose the limitations of claim 15 as applied above. Hosur in view of Chethik, and in further view of Kornfeld do not disclose that each of the amplifier stages has an output coupled to an input of a separate transmit antenna. However, the use of separate transmission antennas is well known in the art as illustrated by Porco (fig. 2, refs. 253-256). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that each of the amplifier stages of Hosur in view of Chethik, and in further view of Kornfeld could be coupled directly to an input of a separate antenna as illustrated by Porco because the additional antenna diversity can be useful for wireless communication.

Regarding claim 21, Hosur in view of Chethik, in further view of Kornfeld, and in further view of Porco disclose the limitations of claim 20 as applied above. Further, they disclose the remaining limitations of claim 21 because, in the combination of Hosur in view of Chethik, in further view of Kornfeld, and in further view of Porco, n=3.

Allowable Subject Matter

12. Claims 10, 11, and 38-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason M. Perilla
August 28, 2007

jmp

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER